

## OPERATING SUMMARY

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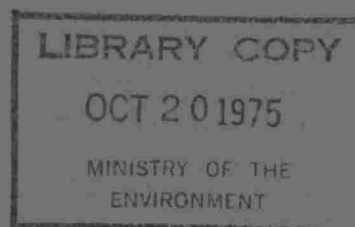
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# SOUTH PEEL SYSTEMS

# LAKEVIEW

WATER SUPPLY SYSTEM and  
WATER POLLUTION CONTROL PLANT

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MINISTRY OF THE ENVIRONMENT



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LAKEVIEW  
WATER POLLUTION CONTROL PLANT  
and  
WATER SUPPLY SYSTEM

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by  
Plant Performance Unit  
TECHNICAL SERVICES BRANCH  
T. Cross, Director

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### WATER SUPPLY SYSTEM

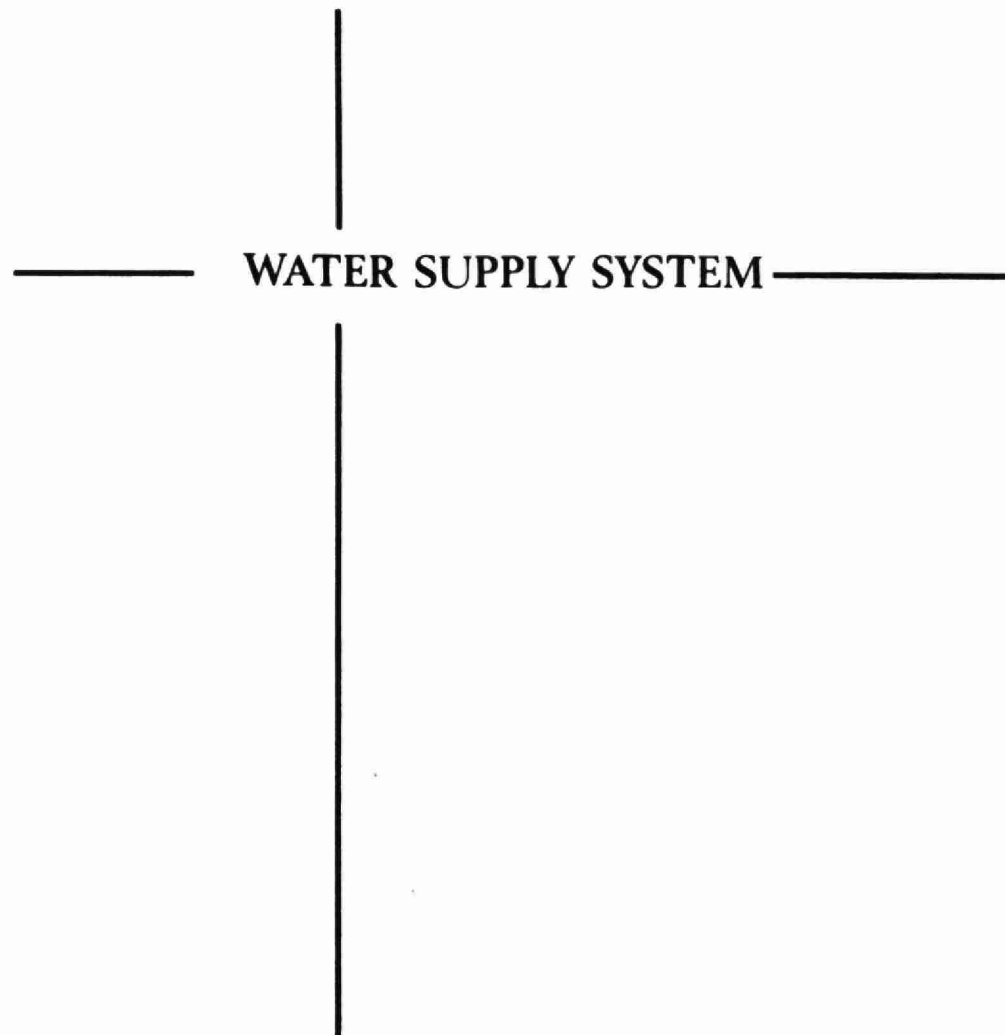
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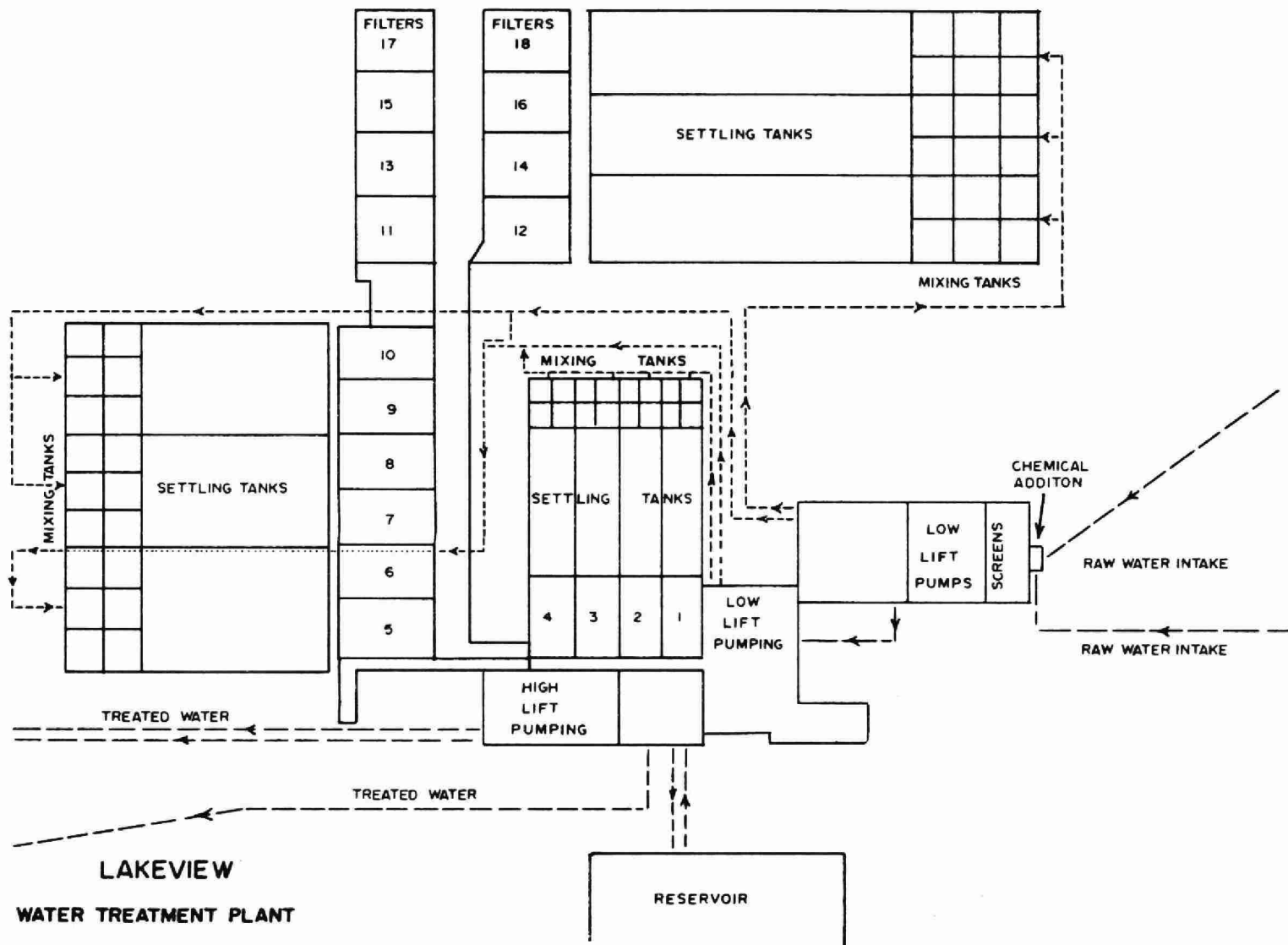
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# DESIGN DATA

PROJECT: Lakeview WTP

NOMINAL CAPACITY: 48 MGD (filters)

INTAKES: No. 1: Size: 30" dia x 2800'  
Capacity: 10 MGD

No. 2: Size: 66" dia x 3050'  
Capacity: 80 MGD

SCREENS: 2, Type: Travelling  
Capacity: (each) 50 MGD at LWL

## LOW LIFT PUMPS:

Station No. 1 Type: Horizontal  
2, Capacity: (each) 3 MGD  
1, Capacity: 6 MGD  
1, Capacity: 10 MGD (Diesel Engine)

Station No. 2 2, Type: Vertical  
Capacity: (each) 12.5 MGD  
(one variable speed)  
  
4, Type: Vertical  
Capacity: (each) 21.0 MGD

## CHLORINATION

2, Prechlorinators  
Capacity: (each) 0-500 lb/day

2, Postchlorinators  
Capacity: 1 at 0-200 lb/day  
1 at 0-400 lb/day

## CHEMICAL ADDITION

2, Alum Storage Tanks  
Capacity: (total) 18,000 gal.  
Alum Feed Rate: 3000 gal/day (max.)

## MIXING TANKS

10, Type: 6-compartment  
Capacity: (total) 1.25 mil gal.

## SETTLING TANKS

10, Capacity: (total) 8.27 mil gal.

## FLUORIDATION

Day Tank - Capacity 120 gal.  
Egg Tank - Capacity: 50 gal.  
Storage Tank - Capacity: 4000 gal.  
Pump Feed Rate: 120 gal/day (max.)

## SODIUM CHLORITE

2, Storage Tanks  
Capacity: (each) 400 gal.

2, Pumps:  
Feed Rate (each) 280 lb/day

## BENTONITE

Dry Chemical Feeder  
Feed Rate: 130 lb/hr.

## FILTERS

4, Size: 16' x 32' area  
Capacity: (each) 1.5 MGD

14, Size: 23' x 46' area  
Capacity: (each) 3.0 MGD

## CLEAR WELL

Capacity: 1 MGD (approx.)

## HIGH LIFT PUMPS

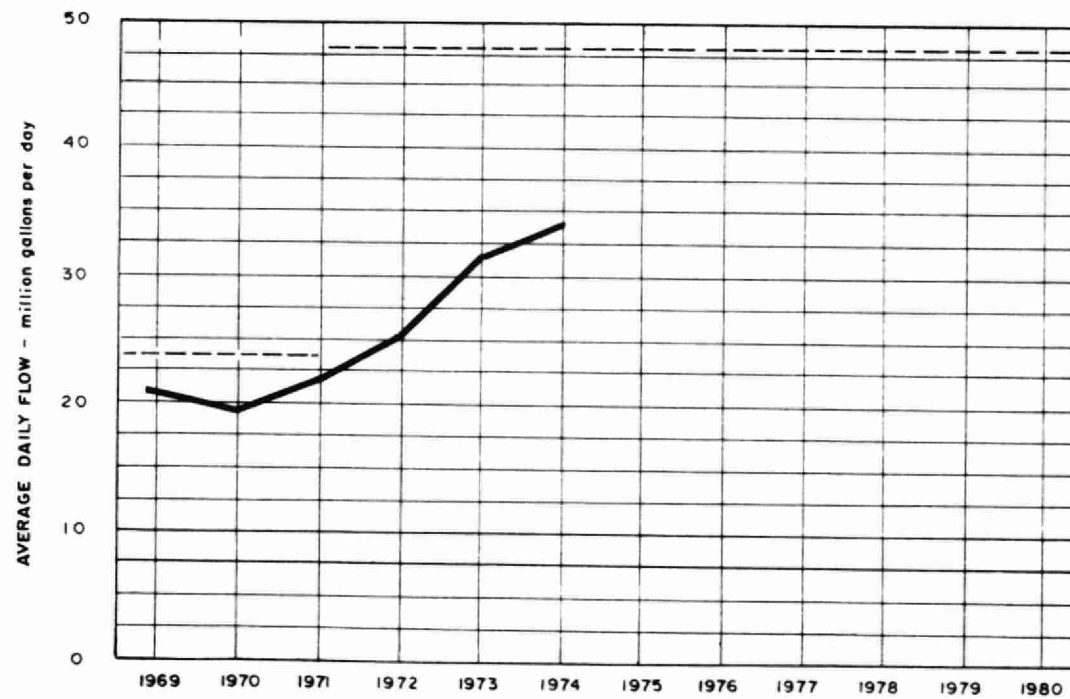
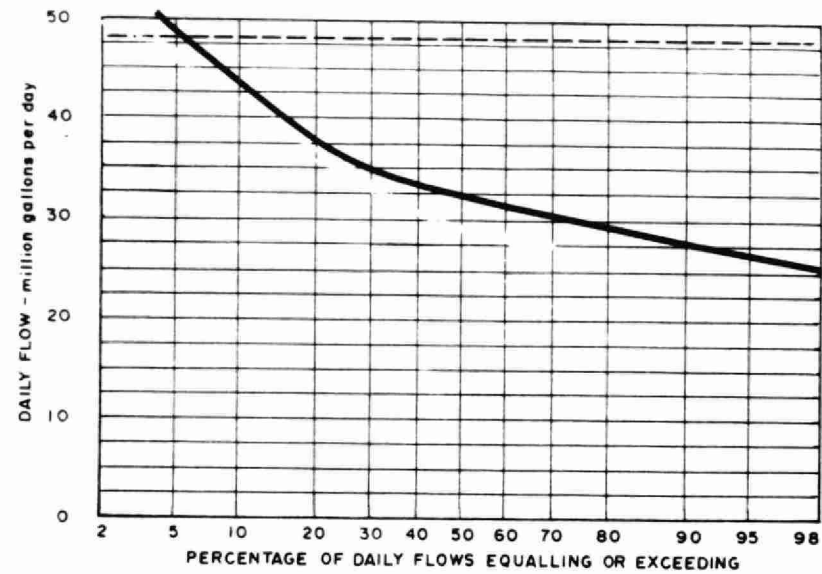
2, Capacity: (each) 4 MGD  
(one with diesel)  
1, Capacity: 6 MGD  
1, Capacity: 10 MGD  
3, Capacity: 14 MGD  
1, Capacity: 20 MGD

## RESERVOIRS

(System Total)  
Capacity: 54 mil gal.



# PROCESS DATA FLOWS



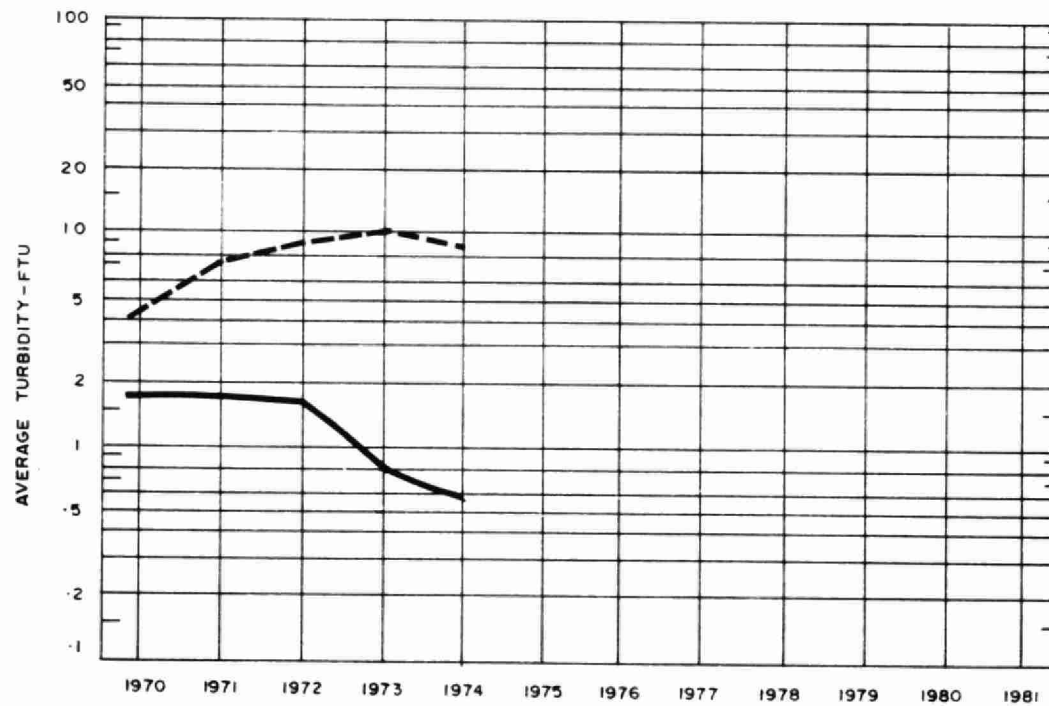
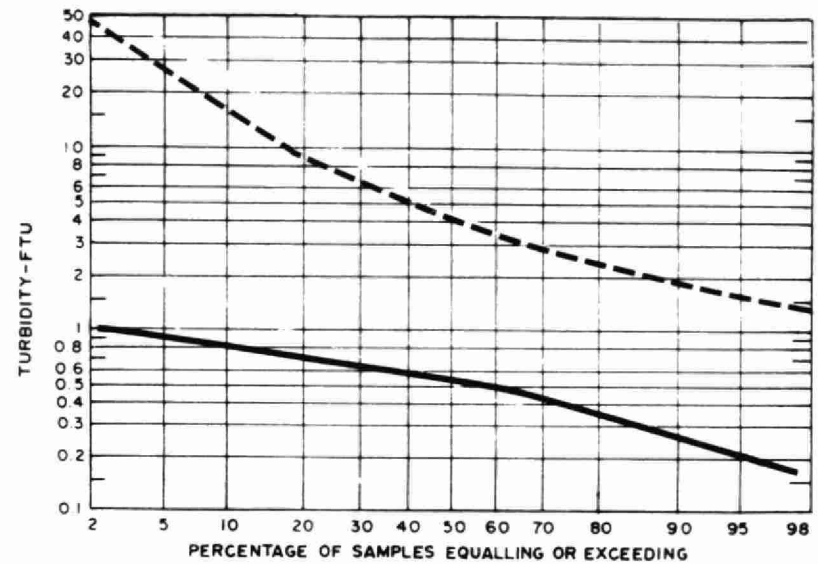
## PLANT PERFORMANCE

MONTH	FLOWS				RAW WATER		TREATED WATER					
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	MAXIMUM RATE mgd	TURBIDITY (AVERAGE) FTU	COLOUR (AVERAGE) App. units	TURBIDITY		COLOUR		TEMPERATURE	
							AVERAGE FTU	MAXIMUM FTU	AVERAGE App. units	MAXIMUM App. units	AVERAGE ° F	MAXIMUM ° F
JAN	914.92	29.52	40.4	42.5	11.6	6	.30	1.90	<5	<5	41	43
FEB	851.31	30.40	35.3	42.0	10.2	5	.36	1.30	<5	<5	41	44
MAR	931.20	30.04	33.8	44.8	20.4	5	.59	1.02	<5	<5	42	45
APR	936.13	31.20	37.5	36.4	15.0	6	.69	1.10	<5	<5	45	48
MAY	1007.53	32.50	40.7	37.1	14.1	6	.69	1.40	<5	<10	48	51
JUNE	1106.17	36.87	48.5	42.1	3.9	6	.73	.88	<5	<10	54	62
JULY	1334.61	43.05	49.6	60.3	2.8	6	.71	1.10	<5	<10	54	64
AUG	1376.99	44.72	71.4	66.3	3.8	6	.67	.88	<5	<5	65	73
SEPT	1065.75	35.52	44.3	48.2	4.4	6	.55	.80	<5	<5	56	68
OCT	990.25	31.94	48.0	37.9	2.7	5	.59	1.00	<5	<5	51	59
NOV	947.72	31.59	48.0	38.5	7.5	6	.42	.90	<5	<5	48	52
DEC	915.27	29.52	33.3	34.6	10.0	6	.40	3.30	<5	<15	42	45
TOTAL	12377.87											
AVG.		33.91	MAXIMUM 66.3	MAXIMUM 71.4	8.8	6	.56	MAXIMUM 3.30	<5	MAXIMUM <15	51	MAXIMUM 73

## CHLORINATION and DISINFECTION

MONTH	RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF CHLORINE USED 10 <sup>3</sup> pounds	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
											PRE - mg/l	POST - mg/l	
	0	1 - 3	4 - 32	33 - 320	> 320								
JAN			1	1	2	4		32		6668	.39	.33	.4
FEB			1	4		4		32		4277	.21	.30	.4
MAR				3		3		24		4671	.15	.34	.4
APR			4	1	1	6	1	41	1	5277	.19	.37	.4
MAY		1	1	2		4		31		5790	.20	.38	.4
JUNE		1	1	2		4		32		7262	.26	.40	.4
JULY	2	2			1	5		40		9528	.33	.39	.4
AUG		1	1	1		3		32	2	13740	.50	.50	.3
SEPT			4	1		5		36		8866	.49	.34	.4
OCT		1		1		2		16		8713	.52	.35	.4
NOV			2	1	1	4		32	1	8103	.64	.19	.5
DEC			3	4	1	8	1	58		7387	.57	.24	.5
TOTAL	2	6	18	21	6	52	2	407	4	90282			
AVG.	30									247	.38	.36	.4

# TURBIDITY



RAW WATER      - - - - -

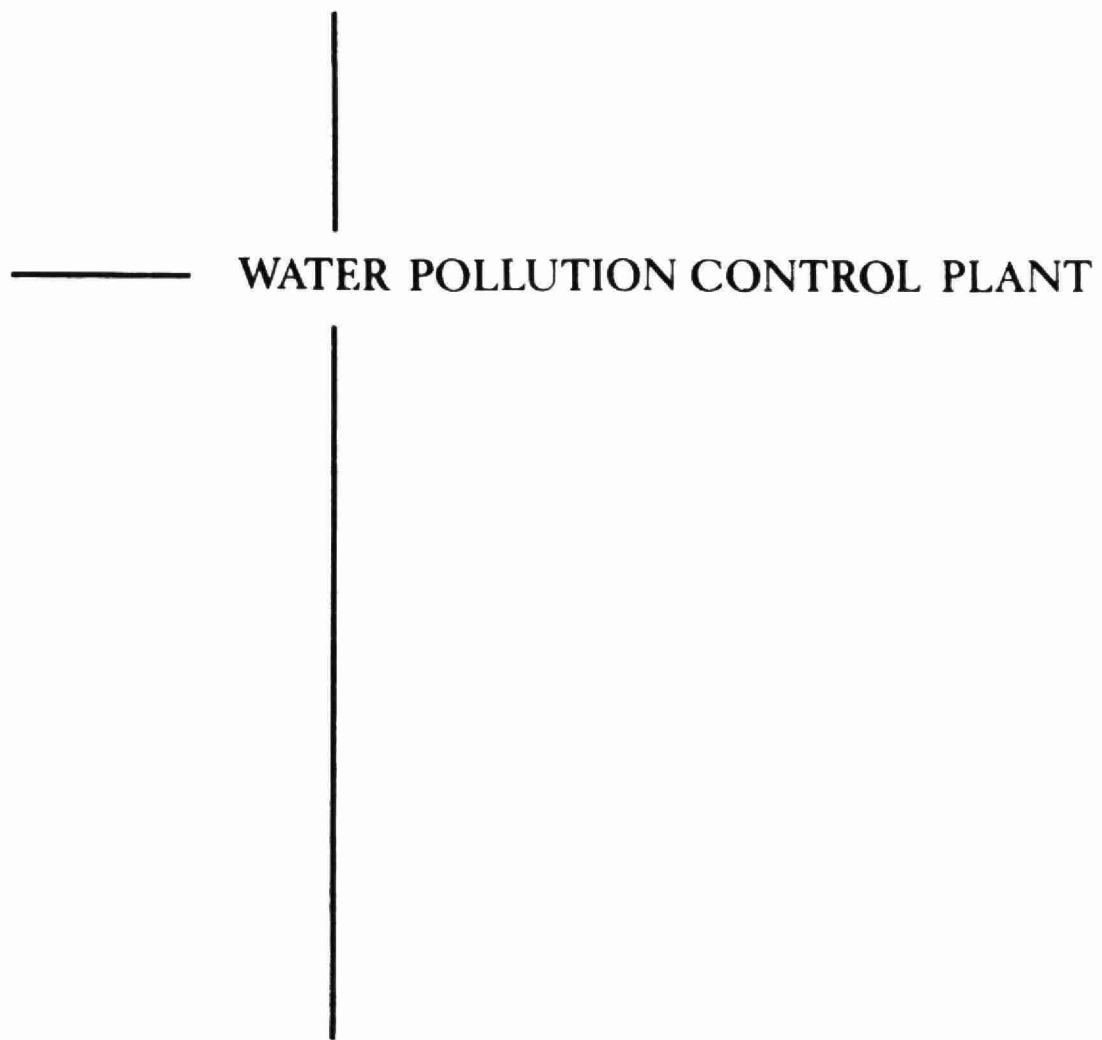
TREATED WATER      —————

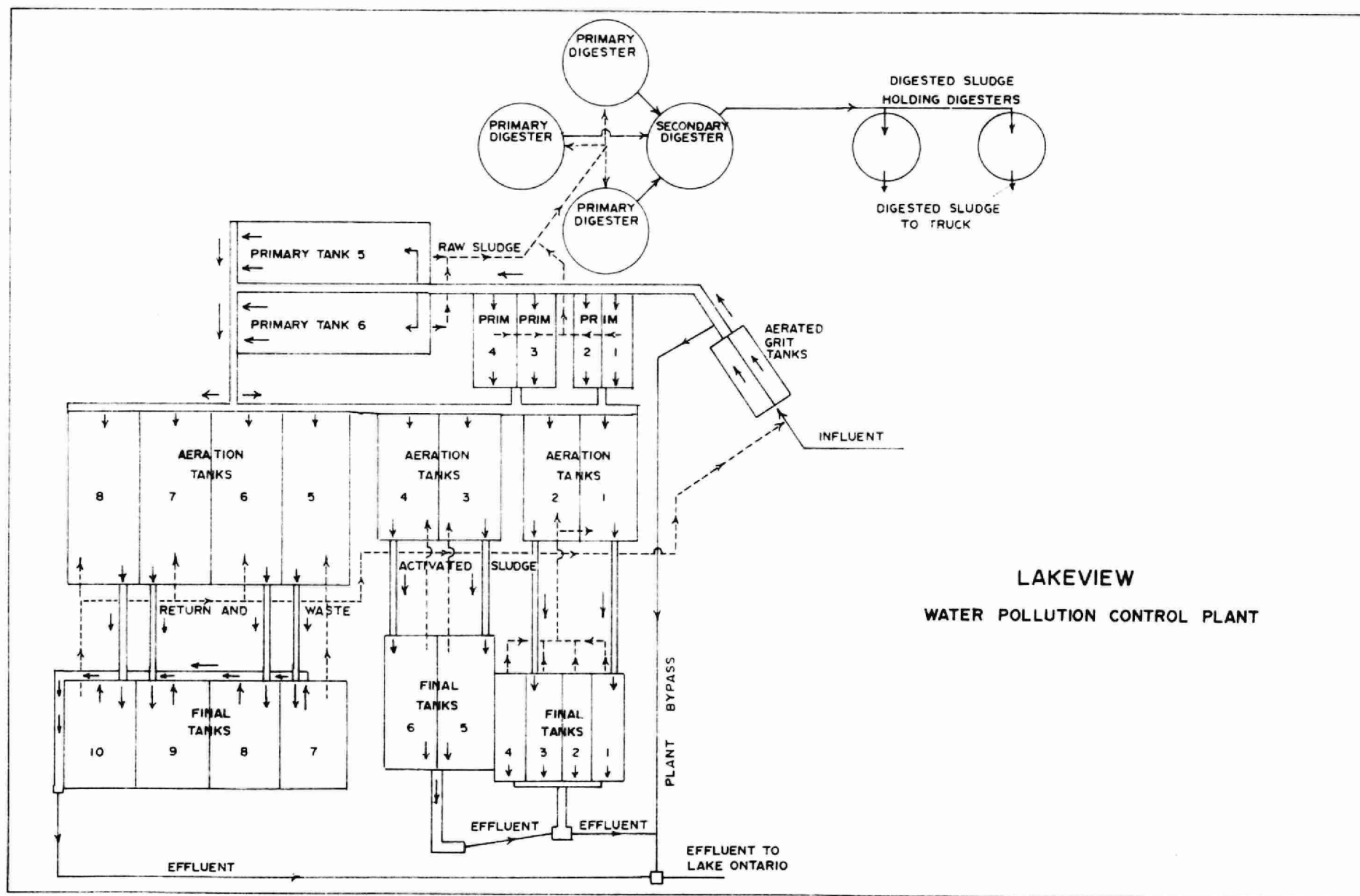
## TREATMENT DATA

MONTH	FILTER		CHEMICALS USED							
	AVERAGE RUN hours	BACKWASH WATER mil. gal.	A L U M		SODIUM CHLORITE		SODIUM SILICOFLOURIDE			
			AMT. USED 10 <sup>3</sup> gallons	DOSAGE mg/l	AMT. USED 10 <sup>3</sup> pounds	DOSAGE mg/l	AMT. USED 10 <sup>3</sup> pounds	RESIDUAL mg/l		
								AVERAGE	MAXIMUM	MINIMUM
JAN	45	17	17.8	12.7	8.6	.9	36.1	1.0	1.15	.6
FEB	46	15	13.1	10.0	3.1	.4	32.2	.9	1.10	.6
MAR	48	20	13.5	9.4	4.0	.4	34.3	1.0	1.20	.8
APR	45	26	12.7	8.8	4.5	.5	35.1	.9	1.15	.2
MAY	44	25	10.4	6.7	4.9	.2	37.2	1.0	1.15	.8
JUNE	48	23	6.5	3.9	5.4	.5	41.4	1.0	1.20	.9
JULY	47	24	6.4	3.1	6.4	.5	49.4	1.0	1.15	.9
AUG	48	26	7.7	3.6	8.7	.6	45.8	1.0	1.25	.6
SEPT	47	21	3.6	2.2	4.6	.4	40.0	1.0	1.19	.6
OCT	46	20	1.3	1.9	4.1	.4	30.0	1.0	1.15	.8
NOV	46	22	8.5	5.8	2.6	.3	39.2	1.0	1.20	.7
DEC	48	22	9.2	6.5	3.1	.3	36.3	1.0	1.20	.2
TOTAL		261	110.7		60.0		457.0			
AVG	49	22		5.8		.5		1.0	1.25	.2

## WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as $\text{CaCO}_3$	411	132	154	100	113	140	150	108	80 - 100
ALKALINITY in mg/l as $\text{CaCO}_3$	46	98	106	74	113	93	106	76	30 - 100
IRON in mg/l Fe	46	.7	4.0	<.05	113	.1	2.1	<.05	Less than 0.3
CHLORIDE in mg/l $\text{Cl}^-$	21	30	38	5	42	32	34	18	Less than 250
pH in pH units	411	7.7	8.5	7.3	426	7.5	8.3	7.2	7.0 - 8.5
FLUORIDE in mg/l $\text{F}^-$	27	.2	1.1	.1	387	1.0	1.25	.2	Less than 1.2
AMMONIA in mg/l as N	410	.1	1.0	.02	104	<.1	1.0	.1	Less than 0.5
TOTAL KJELDAHL NITROGEN in mg/l as N	44	.5	2.3	.2	101	.3	1.0	.1	Less than 1.
NITRITE in mg/l as N	41	.3	.8	.004	98	.3	.6	.2	
NITRATE in mg/l as N									Less than 10
TOTAL PHOSPHORUS in mg/l as P									
SOLUBLE PHOSPHORUS in mg/l as P									
PHENOLS in $\mu\text{g/l}$ as $\text{C}_6\text{H}_5\text{OH}$									Less than 1







# DESIGN DATA

SOUTH PEEL - LAKEVIEW WPCP

## TYPE: CONVENTIONAL ACTIVATED SLUDGE

DESIGN FLOW 37.5 MIGD  
DESIGN BOD 300 mg/l  
DESIGN S.S. 350 mg/l

### PRETREATMENT

#### - Grit Removal

Aerated tanks  
Two 106' x 21' x 13.5'  
Total vol. 375,000 gal.  
Air supply 4.2 - 6 cfm

#### - Screening

Mechanical front cleaned screens  
Two with 3/4' openings in 7' channels

### PRIMARY SEDIMENTATION

Two 87' x 32' x 12'  
Two 87' x 48' x 12'  
Two 214' x 65' x 12'  
Total vol: 3.12 MG  
Detention Time: 2 hr.  
Overflow rate 900 gpd/ft<sup>2</sup>

### SECONDARY TREATMENT

#### - Aeration Tanks

Diffused air; SPARGERS  
Two 3-pass tanks, 144' x 63' x 14.3'  
Two 3-pass tanks, 144' x 60' x 15'  
Two 4-pass tanks, 216' x 80' x 14'  
Total volume: 9.28 MG  
Detention time: 5.9 hr.  
Air supply: Three BROWN-BOVERI  
each 30,000 cfm

#### - Secondary Sedimentation

Four 87' x 32' x 12'  
Two 104' x 48' x 12'  
Four 140' x 79' x 12'  
Total volume: 4.93 MG  
Detention time: 3.2 hr.  
Overflow rate: 575 gpd/ft<sup>2</sup>

### CHLORINATION

One F & P 2000 lb/day cap.  
Three W & T 2000 lb/day cap.  
Supply: rail tank cars.

### SLUDGE HANDLING

#### - Primary Digesters

Fixed roof, mixed by gas recirculation  
Three 100' dia. x 30.5' swd  
Total volume 7.88000 ft<sup>3</sup> or 4.9 MG

#### - Secondary Digesters

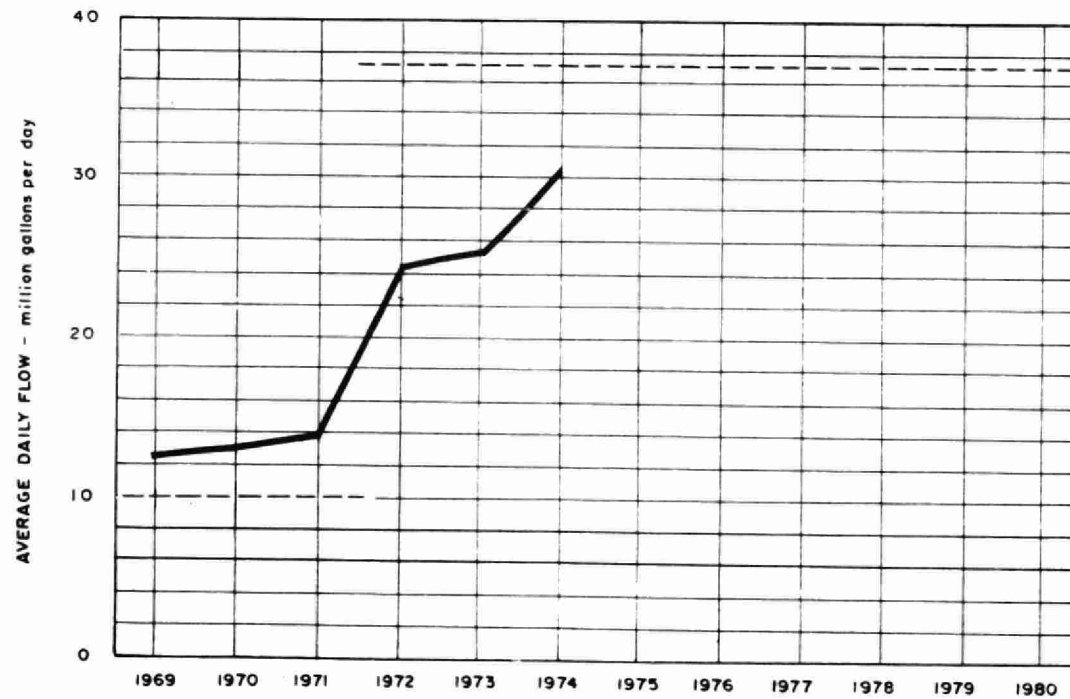
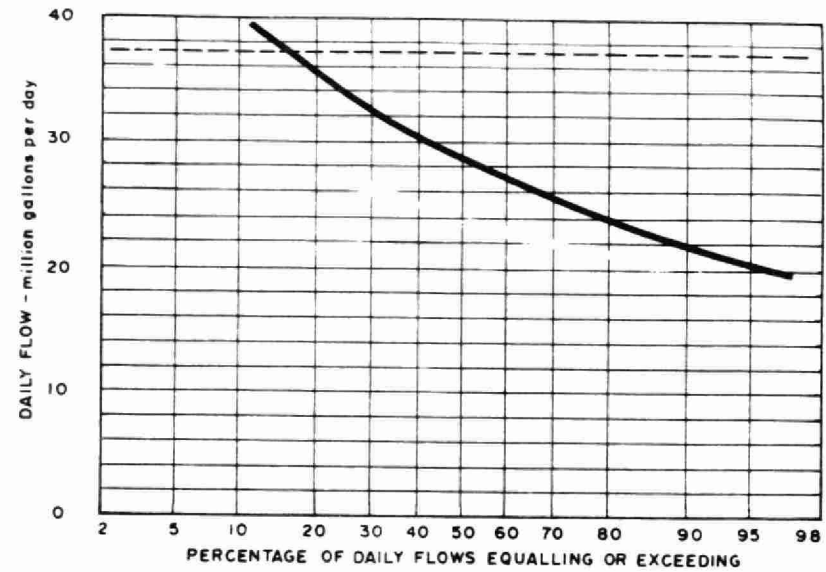
Fixed concrete roof  
One 100' dia x 30.5 swd  
Volume: 262,000 ft<sup>3</sup> or 1.64 MG

#### - Holding Digesters

Fixed concrete roof  
Two 80' dia x 25.5' swd  
Total volume: 256,000 ft<sup>3</sup> or 1.60 MG

(NOTE: Two tanks 65' dia x 25' swd not in use)

# PROCESS DATA FLOWS

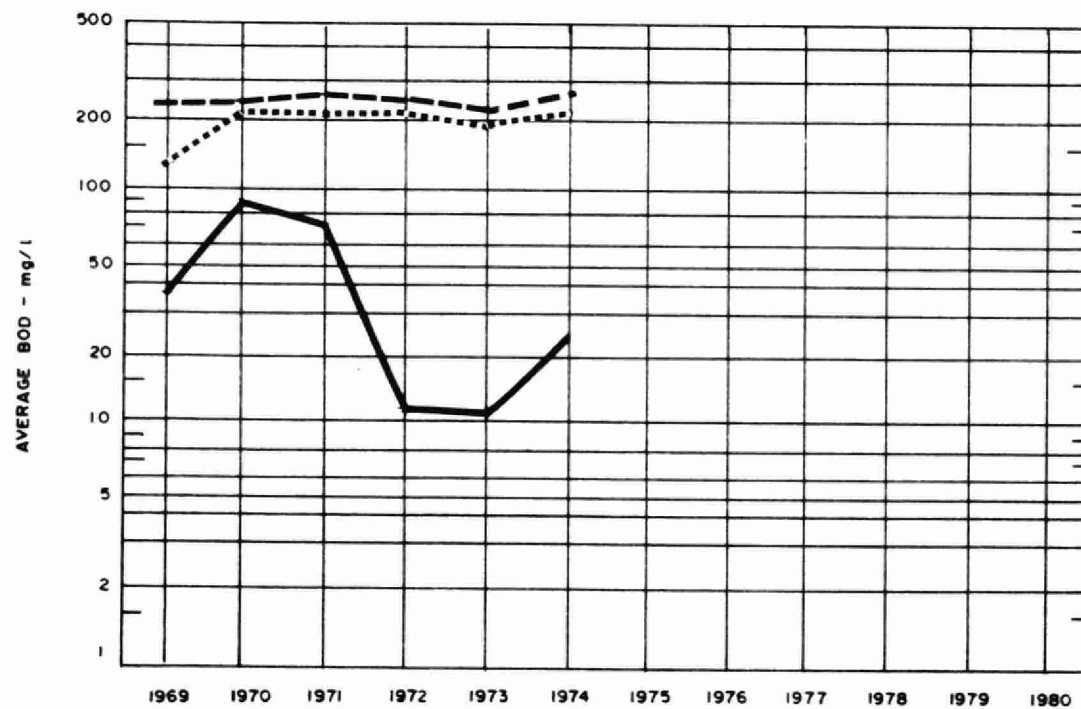
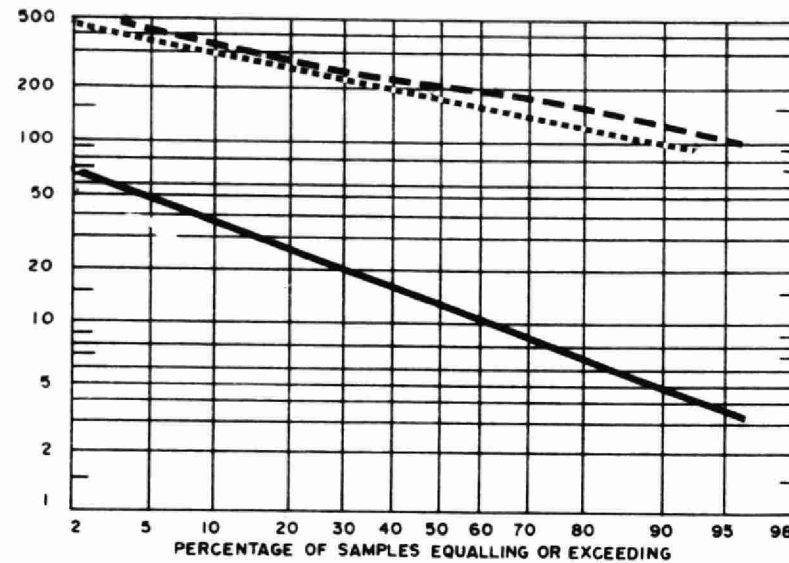


DESIGN CAPACITY — — — — —

# PLANT PERFORMANCE

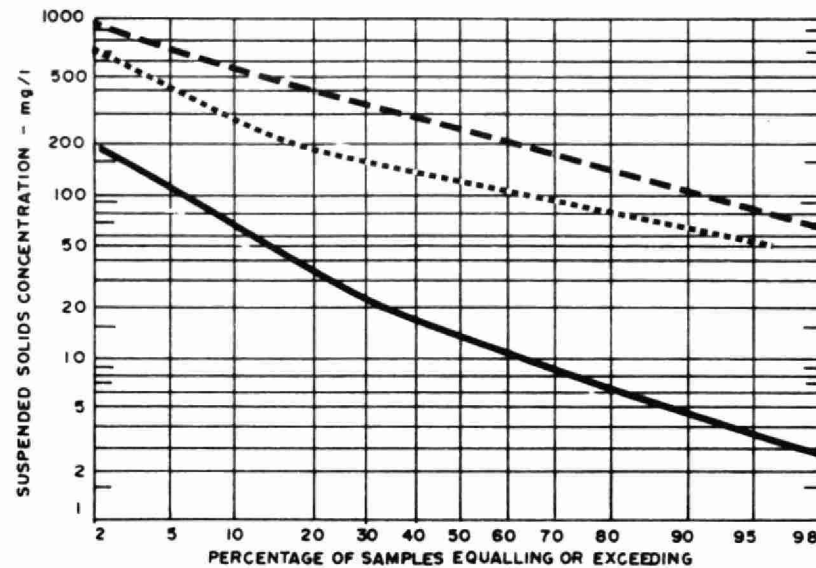
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 <sup>6</sup> pounds	mg/l	mg/l	%	10 <sup>6</sup> pounds	mg/l P	mg/l P
JAN	863	28	61	213	25	88	1.6	364	62	83	2.6	14.0	4.5
FEB	879	31	47	250	22	91	2.0	360	36	90	2.8	9.8	1.8
MAR	1014	33	47	259	23	91	2.4	438	34	92	4.1	11.0	3.1
APR	1043	35	53	271	26	90	2.6	252	10	96	2.5	9.1	2.7
MAY	1258	41	69	245	17	93	2.9	221	18	92	2.6	10.7	2.4
JUNE	1022	34	42	237	29	88	2.1	197	16	92	1.8	6.7	3.0
JULY	861	28	34	217	33	85	1.6	187	20	89	1.4	8.1	3.5
AUG	876	28	33	183	10	95	1.5	210	14	93	1.7	9.2	2.5
SEPT	878	29	33	235	32	86	1.8	225	22	90	1.8	8.2	2.6
OCT	872	28	31	440	40	91	3.4	647	49	92	5.2	20.0	1.3
NOV	886	30	43	264	25	91	2.1	327	26	92	2.7	11.0	5.5
DEC	865	28	31	285	18	94	2.3	247	13	95	2.0		
TOTAL	11317	-	-	-	-	-	25.7	-	-	-	30.7	-	-
AVG.	943	31	MAXIMUM 69	252	25	90	2.1	297	26	91	2.6	10.2	2.9
No. of Samples	-	-	-	320	346	-	-	299	325	-	-	24	38

# BIOCHEMICAL OXYGEN DEMAND



PLANT INFLUENT      - - - - -  
 PRIMARY EFFLUENT      . . . . .  
 PLANT EFFLUENT      —————

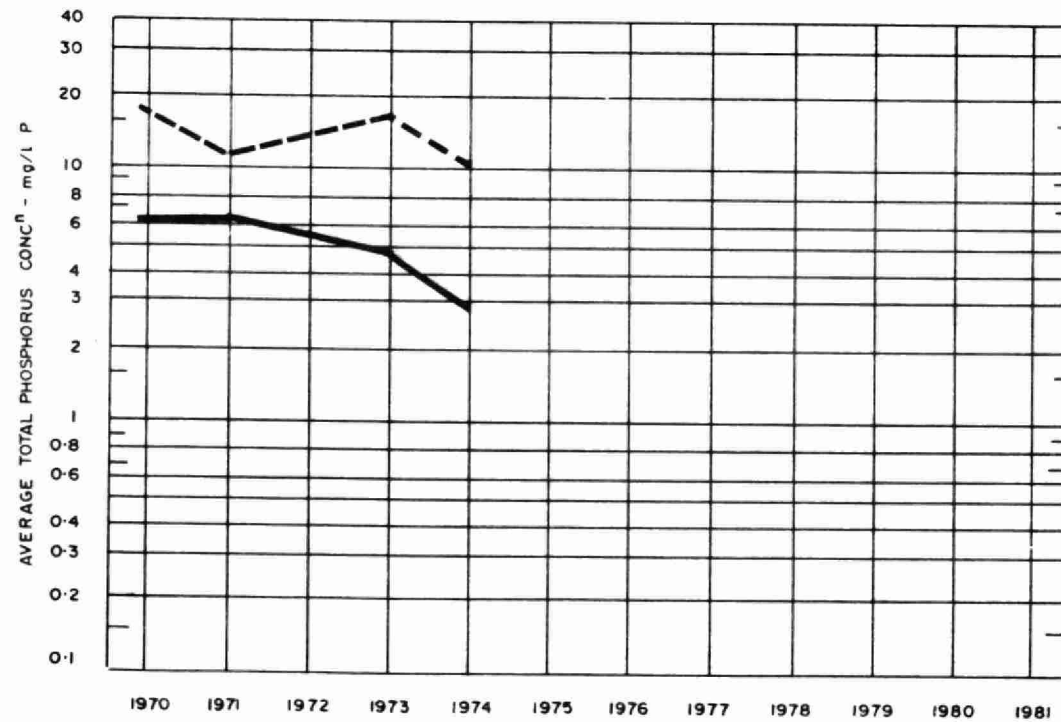
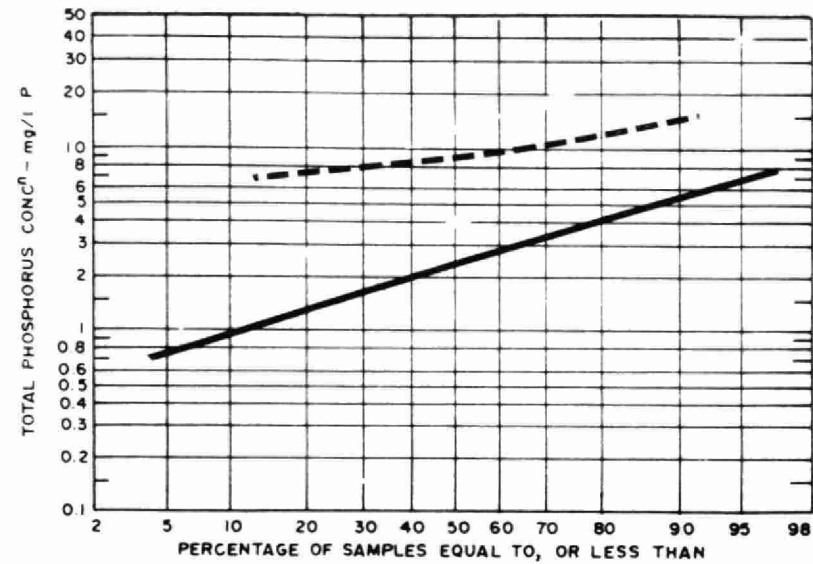
# SUSPENDED SOLIDS



PLANT INFLUENT      - - - - -  
 PRIMARY EFFLUENT      . . . . .  
 PLANT EFFLUENT      —————



# PHOSPHORUS

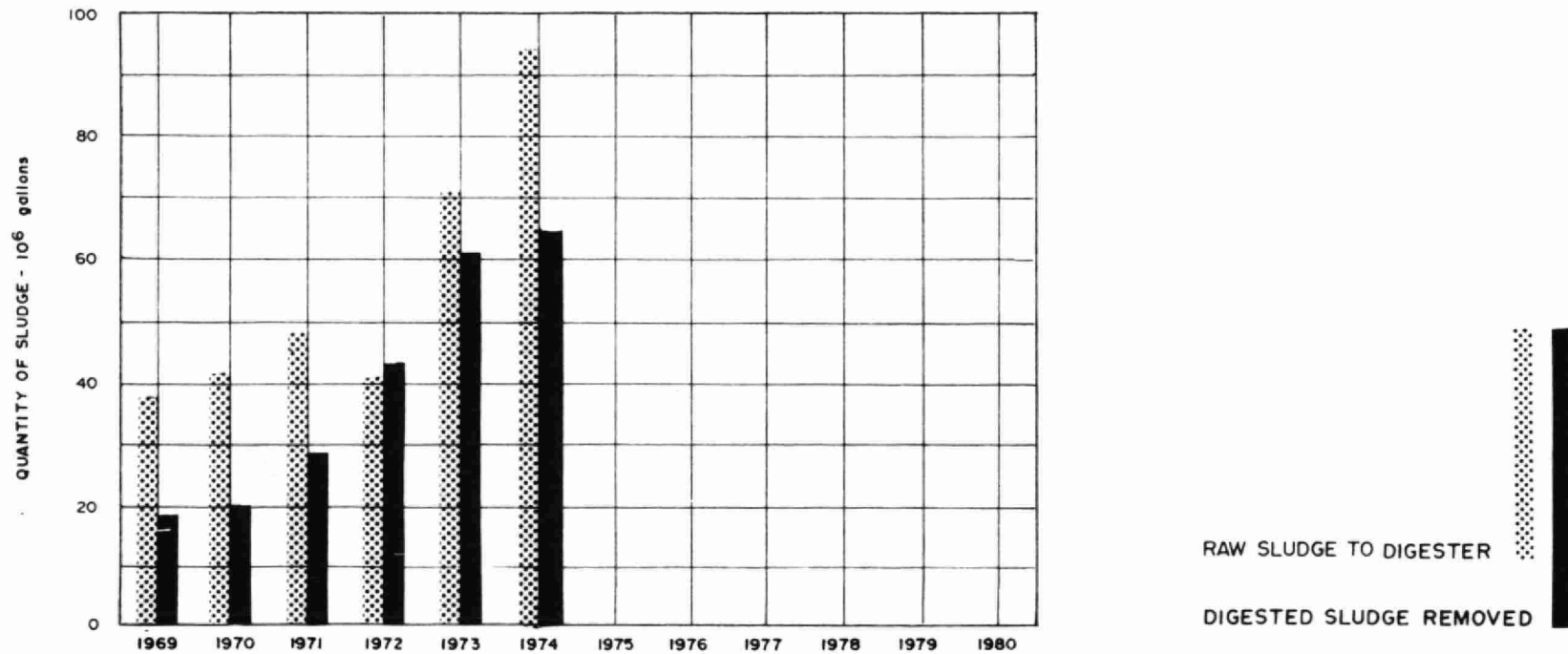
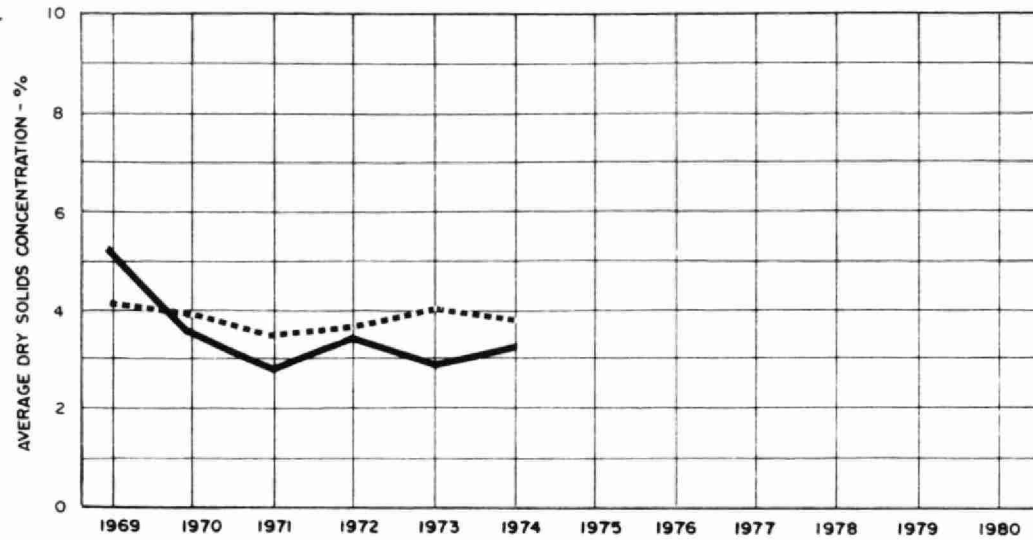


PLANT INFLUENT

PLANT EFFLUENT

# DIGESTION

RAW SLUDGE .....  
DIGESTED SLUDGE ———



RAW SLUDGE TO DIGESTER .....  
DIGESTED SLUDGE REMOVED ———

## TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL <sub>2</sub> USED 10 <sup>3</sup> pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day <sup>-1</sup>	AIR 1000 ft <sup>3</sup> lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED thousand cubic yards
									QUANTITY 10 <sup>6</sup> gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 <sup>6</sup> gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	1400	64.8	7.5	233	245	2200	.32	1.2	7.2	4.1	68	5.4	3.6	71	2.0	31.9
FEB	1550	57.3	6.5	242	171	2400	.34	1.0	7.7	4.5		4.2	3.3			25.1
MAR	2300	38.9	3.8	154	102	2400	.23	1.5	6.9	4.0	68	2.1	4.7		1.7	12.6
APR	2830	34.2	3.2	182	126	2200	.31	1.2	6.3	4.2	69	2.6	4.0	44	.9	15.8
MAY	4100	38.5	3.1	166	118	2500	.29	1.2	7.7	4.0	63	5.3	3.2	50	.3	31.3
JUNE	3000	48.2	4.7	185	119	2400	.38	1.4	6.5	3.9	65	5.8	3.8	42	2.0	34.6
JULY	3650	43.4	5.0	207	106	2400	.26	1.3	7.5	4.0	71	6.8	3.4	56		40.4
AUG	1000	38.6	4.4	124	86	2300	.16	2.1	5.9	4.1	69	5.9	3.5	53		35.2
SEPT	2000	33.1	3.8	223	145	3000	.23	1.2	5.8	3.4		6.0	2.6		.3	35.4
OCT	1400	35.2	4.0	534	1133	2900	.56	.5	9.2	3.1	71	7.0	3.0	58	.9	41.7
NOV	1100	56.1	6.3	229	159	2900	.25	1.2	9.4	3.3	73	7.0	2.3	60		41.3
DEC	700	47.2	5.4	227	152	3200	.21	1.1	13.6	3.3	72	7.1	2.5	58		42.4
TOTAL	25030	535.5	-	-	-	-	-	-	93.7	-	-	65.2	-	-	-	387.7
AVG.	2.2 cu. ft/mil gal	44.6	4.7	226	222	2600	.30	1.2	7.8	3.8	69	5.4	3.3	55	1.2	32.3



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